

CLAIMS

What is claimed is:

1. A particulate packaging apparatus comprising:
 - a first container defining a first opening and a second opening;
 - a first sealing device removeably coupled to the first container and adapted to seal the first opening;
 - a second sealing device removeably coupled to the first container and adapted to seal the second opening, wherein the first container and the first and second sealing devices define a chamber;
 - an allograft contained within the chamber, wherein the first container is adapted to maintain a negative pressure within the chamber; and
 - a second container adapted to enclose the first container and maintain a negative pressure therein.
2. The apparatus of Claim 1, wherein the first container is a syringe barrel.
3. The apparatus of Claim 1, wherein the first sealing device is a valve.
4. The apparatus of Claim 1, wherein the first sealing device is a vented valve.

5. The apparatus of Claim 1, wherein the first sealing device is interconnected to the first container with a leur fitting.

6. The apparatus of Claim 1, wherein the first sealing device is a hydrophobic, gas permeable membrane.

7. The apparatus of Claim 1, wherein the second sealing device is adapted to slidably translate within said chamber.

8. The apparatus of Claim 7, further comprising a plunger at least partially inserted into the second opening and adapted to slidably translate the second sealing device.

9. The apparatus of Claim 1, wherein the first container is adapted for direct application of the allograft to a surgical site.

10. The apparatus of Claim 1, wherein the second container is a vacuum bag.

11. The apparatus of Claim 1, wherein the second container is a glass jar.

12. The apparatus of Claim 1, further comprising a third container adapted to removably couple to the second sealing device, wherein the third container is further adapted to deliver a liquid to the first container.

13. The apparatus of Claim 1, wherein the third container is a syringe adapted to couple to the first container with a leur fitting.

14. The apparatus of Claim 1, wherein the third container is a syringe adapted to couple to the first container with a hypodermic needle.

15. An particulate packaging apparatus comprising:
 - a first container defining a first opening and a second opening;
 - a sealing device removeably coupled to the first container and adapted to seal the first opening;
 - a hydrophobic, gas permeable membrane removeably coupled to the first container and adapted to prevent liquids from passing therethrough, wherein the first container, the sealing device, and the gas permeable membrane define a primary chamber;
 - a porous, implantable substrate contained within the primary chamber;
 - a second container defining a primary opening adapted to receive at least a portion of the first container, wherein the second container, the sealing device and at least a portion of the first container define at least a partial boundary of a vacuum chamber.

16. The apparatus of Claim 15, wherein the vacuum chamber is defined in part by the primary chamber.

17. The apparatus of Claim 15, wherein the first container is adapted for direct application of the substrate to a surgical area, wherein the gas permeable membrane is removed from the second opening to allow the application of the substrate.

18. The apparatus of Claim 15, wherein the first container is a syringe barrel.

19. The apparatus of Claim 15, further comprising:
a syringe cap removeably coupled to the first container and adapted to cover the second opening, wherein the syringe cap defines an aperture and the gas permeable membrane is positioned adjacent the cap such that liquids are not allowed to pass through the first container.

20. The apparatus of Claim 15, wherein the vacuum chamber is maintained at a negative pressure.

21. The apparatus of Claim 15, wherein the second container is a glass jar.

22. The apparatus of Claim 15, wherein the particulate is an allograft.

23. A method of delivering an implantable substrate to a surgical area comprising:

providing a first container housed within a second container, wherein a sealing device defines at least a part of the first container and the substrate is located within the first container;

engaging the sealing device with a reconstituting delivery device; and
delivering a reconstituting liquid into the first chamber while preventing the introduction of significant amounts of gasses into the first chamber.

24. The method of Claim 23, further comprising:

removing the first container from the second container; and
opening the sealing device.

25. The method of Claim 24, wherein opening the sealing device includes removing a membrane from the first container.

26. The method of Claim 24, wherein opening the sealing device includes opening a valve.

27. The method of Claim 23, wherein the sealing device is a gas permeable membrane.

28. The method of Claim 23, further comprising inserting a plunger into the first container.

29. The method of Claim 23, further comprising removing the substrate from the first container.

30. The method of Claim 23, wherein a plunger seal is interposed between the sealing device and the substrate within the first chamber.

31. The method of Claim 30, wherein the first container defines at least a part of a pressure boundary, and the pressure boundary is adapted to maintain a negative pressure.

32. The method of Claim 30, wherein the sealing device defines at least a part of the pressure boundary.

33. The method of Claim 23, wherein engaging the sealing device with the reconstituting delivery device includes piercing the sealing device.

34. The method of Claim 23, wherein engaging the sealing device with the reconstituting delivery device includes coupling the sealing device with a leur fitting.

35. The method of Claim 23, wherein delivering the reconstituting liquid includes injecting the reconstituting liquid into the first container through a leur fitting.

36. The method of Claim 23, wherein delivering the reconstituting liquid includes injecting the reconstituting liquid into the first container through a hypodermic needle.

37. The method of Claim 23, wherein the second container is a sealed bag.

38. The method of Claim 23, wherein the second container is a glass jar.